

# 22474

**23124**

**3 Hours / 70 Marks**

Seat No. 

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- Instructions* – (1) All Questions are *Compulsory*.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data, if necessary.
- (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

- 1. Attempt any FIVE of the following :** **10**
- a) State Pascals law.
  - b) State the function of oil filter and draw its symbol.
  - c) Draw symbol of sequence valve used in hydraulic circuit.
  - d) Draw symbol of FRL unit.
  - e) State the function of Impulse valve.
  - f) Draw symbol of 4/3 solenoid operated direction control valve.
  - g) Draw symbol of shuttle valve and twin pressure valve used in pneumatic system.

P.T.O.

- 2. Attempt any THREE of the following :** **12**
- a) Compare hydraulic and pneumatic system based on following points
    - i) Working fluid used
    - ii) Power to size ratio
    - iii) Speed of operation
    - iv) Application
  - b) Draw a neat sketch of pressure relief valve used in hydraulic system and label following parts.
    - i) Conical poppet
    - ii) Spring
    - iii) Screw
    - iv) Valve body
  - c) Explain pneumatic circuit for operation of pneumatic single acting cylinder using 3/2 direction control valve.
  - d) Explain general layout of pneumatic system with neat sketch.
- 3. Attempt any THREE of the following :** **12**
- a) Construct meter out circuit for oil hydraulic system using appropriate DCV.
  - b) Describe working of reciprocating air compressor with neat sketch.
  - c) Compare meter in circuit with meter out circuit (any four points)
  - d) Construct a circuit to operate unidirectional Air motor using solenoid operated 3/2 DCV.

- 4. Attempt any THREE of the following :** **12**
- a) Describe working of external gear pump with neat sketch.
  - b) State various faults and their remedies in hydraulic system..
  - c) Describe construction and working of double acting cylinder with neat sketch.
  - d) Draw neat sketch of straight axis piston pump and state the significance of swash plate.
  - e) Draw symbol of following
    - i) Unidirectional hydraulic motor.
    - ii) Bi-directional variable speed hydraulic motor.
- 5. Attempt any TWO of the following :** **12**
- a) Explain time delay valve with circuit diagram.
  - b) Construct a sequencing circuit to operate two pneumatic single acting cylinders in sequence using sequence valve.
  - c) Construct electro-hydraulic circuit for operation of double acting cylinder using solenoid operated 4/2 direction control valve.
- 6. Attempt any TWO of the following :** **12**
- a) State Bernoulli's equation and give any four assumptions made while deriving it.
  - b) Explain with neat sketch the pressure temperature compensated flow control valve.
  - c) Construct and describe speed control circuit for pneumatically operated bi-directional motor.
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